

THE 2014 ASSESSMENT OF STREAM QUALITY IN THE PIEDMONT AND SOUTHERN APPALACHIAN MOUNTAIN REGION OF SOUTHEASTERN UNITED STATES

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During the spring and summer of 2014, the U.S. Geological Survey (USGS) National Water-Quality Assessment Program (NAWQA) assessed stream quality across the Piedmont and southern Appalachian Mountain region in the southeastern United States. The goal of the Southeast Stream Quality Assessment (SESQA) is to characterize multiple water-quality factors that are stressors to aquatic life – contaminants, nutrients, sediment, and streamflow alteration – and the relation of these stressors to ecological conditions in streams throughout the region. Two of the most important anthropogenic factors affecting water quality in the region are urbanization and streamflow alteration; therefore, these factors were targeted in the assessment. Findings from the assessment will provide communities and policymakers with information about what human and environmental factors are the most critical in controlling stream quality, which will provide insight about possible approaches to protect and improve stream quality. The targeted design of the assessment used streamflow and land-use data to identify and select sites that reflected a range in the amount of urbanization and streamflow alteration. One hundred twenty-one sites were selected and sampled across the region for as many as 10 weeks during April, May, and June 2014 for contaminants, nutrients, and sediment. This water-quality “index” period culminated with an ecological survey of habitat, periphyton, benthic macroinvertebrates, and fish at all sites. Sediment was collected during the ecological survey for analysis of sediment chemistry and toxicity testing. Of the 121 sites, 59 were on streams in watersheds with varying degrees of urban land use, 5 were on streams with numerous confined feeding operations (CAFOs), and 13 were reference sites with little or no development in their watersheds. The remaining 44 “hydro” sites were on streams in watersheds with relatively little agricultural or urban development but with hydrologic alteration, such as a dam or reservoir. This presentation will provide a detailed description of and preliminary findings from the specific study components of the SESQA that included surveys of ecological conditions, routine water sampling, deployment of passive polar organic compound integrative samplers (POCIS) of pesticides and contaminants of emerging concern, and synoptic sediment sampling and toxicity testing at all urban, CAFO, and reference sites. At a subset of urban sites, continuous water-quality monitoring and daily pesticide sampling also were conducted and will be described. Hydro sites had a reduced scope for its assessment that included synoptic surveys of ecology, sediment chemistry, and water chemistry.

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